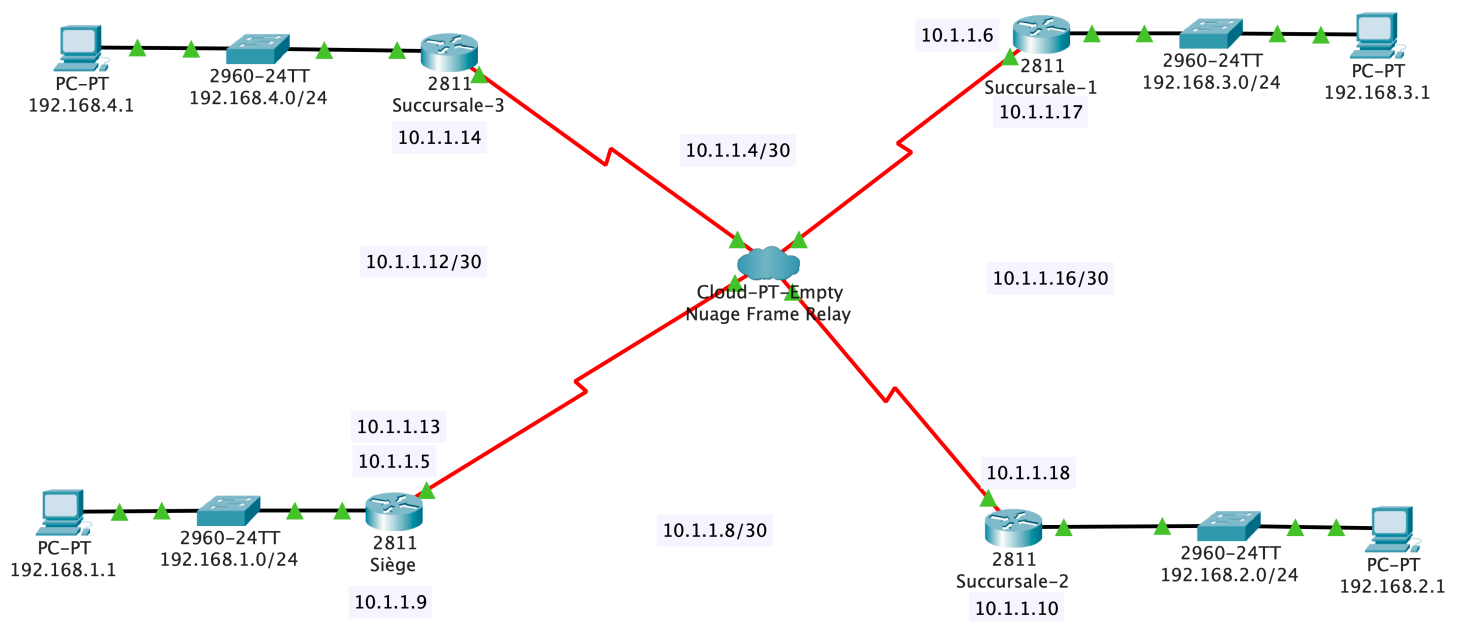


# Mise en place du Frame Relay

## Cours de Réseaux

TP du 19 Mars 2020

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*The network diagram requested*

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## Introduction

In this TP we applied a network with Frame Relay using OSPF protocol. The based network had a Headquarter and two branches and we are asked to add two sections. A third branche with the name "Succursale-3" and a new "Virtual Circuit" with the bandwidth of 20Mbps between the branches "Succursale-1" and "Succursale-2". The reason for this new connection is to avoid passing traffic between "Succursale-1" and "Succursale-2" from the Headquarter with the name "Siege". For this purpose we just need to add these devices: a new Router 2811 ", a new Switch 2960, a new PC and some cables!.



We have 4 different parts for each section of TP:

### Section one: Adding a new branche

- 1-1 Frame Relay
- 1-2 Physical Interface and Sub-interfaces
- 1-3 PC's
- 1-4 OSPF

### Section Two: Adding a new Virtual Circuit between S1 and S2

- 2-1 Frame Relay
- 2-2 Physical Interface and Sub-interfaces
- 2-3 PC's
- 2-4 OSPF

## Section one: Adding a new branche

### 1- Frame Relay:

Frame relay is a telecommunication technology for data transmission for intermittent traffic between LANs and between WANs.

DLCI:

**Data Link Connection Identifier** is an identifier number to assign frames to a specific PVC or **Private Virtual Circuit**. DLCIs are preloaded into each switch and act as road signs to the traveling frames. We can assign a name to each DLCI to facilitate remembering them. For example in our network we add DLCI 102 for serial1 with the name “VersS2” that will understand that this link will go to S2 router.

For our new branche “Succursale-3” we needed to add a third DLCI in our serial0 with the name “103 VersS3” and also a new DLCI “101 VersSiege” in serial3 and we make a link between them in Frame Relay.

CONNECTIONS			
Frame Relay	DLCI	Name	
DSL		Add	Remove
Cable	DLCI	Name	
<b>INTERFACE</b>	101	VersSiege	
Serial0			
Serial1			
Serial2			
Serial3			
Serial4			
Serial5			

CONNECTIONS			
Frame Relay	DLCI	Name	
DSL		Add	Remove
Cable	DLCI	Name	
<b>INTERFACE</b>	101	VersS1	
Serial0	102	VersS2	
Serial1	103	VersS3	
Serial2			
Serial3			
Serial4			
Serial5			

*Adding DLCI 101 in the port serial3*

*Adding DLCI 103 in the port serial0*

Frame Relay			
DSL	1	Serial0	VersS1
Cable	2	Serial0	VersS2
<b>INTERFACE</b>	3	Serial0	VersS3
Serial0	4	Serial1	VersS2
Serial1		Serial2	VersSiege
Serial2			
Serial3			
Serial4			

*Adding a connection between serial0 and serial3*

For the new 20Mbps connection we needed to add a second DLCI in our serial1 and serial2 port of Frame Relay and then we make a connection between them in Frame Relay.

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## 2- Physical Interface and Sub-interfaces:

As we added a new Router, we need to add two new Network (in both sides of this Router). In the PC side, we added 192.168.4.0/24 network and in the Frame Relay side we added 10.1.1.12/30 network. As we know, we just have two available IP addresses in a /30 network. In this case we used 10.1.1.13 for the "Siege" in the sub-interface Serial0/0/0.101 and 10.1.1.14 for the "Succursale-3" in the sub-interface Serial0/0/0.103. Also we used 192.168.4.1 for the PC in this network.

In the below you can see this part of configuration from "Succursale-3" and "Siege" routers.

"Succursale-3" router:	"Siege" router:
interface FastEthernet0/0	interface Serial0/0/0
ip address 192.168.4.254 255.255.255.0	no ip address
<b>Sub-interface:</b>	encapsulation frame-relay ietf
interface Serial0/0/0	interface Serial0/0/0.103 point-to-point
no ip address	description *** Vers S3
encapsulation frame-relay ietf	bandwidth 10000
interface Serial0/0/0.101 point-to-point	ip address 10.1.1.13 255.255.255.252
description *** Vers le Siege	frame-relay interface-dlci 103
bandwidth 10000	
ip address 10.1.1.14 255.255.255.252	
frame-relay interface-dlci 101	

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### 3- PC's:

For the new PC in the 192.168.4.0/24 network, we used 192.168.4.1 IP address. We used 192.168.4.254 that is the IP of router "Succursale-3" hand in this network as gateway and also we used a /24 subnet mask. With /24 we can have 254 different IP addresses.

### 4- OSPF:

OSPF is stands for **O**pen **S**hortest **P**ath **F**irst and it is a network protocol and is designed as an interior gateway protocol (IGP), for use in an autonomous system such as a local area network (LAN).

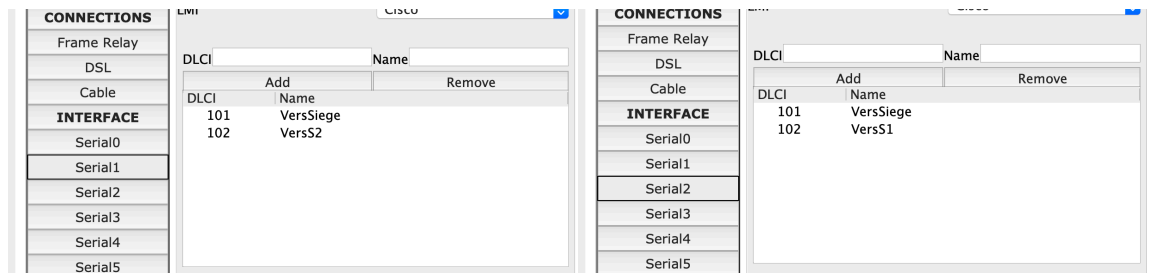
In our new branche we announced our two new networks to the other routers by the commands below. We used Single-area OSPF in our network architecture (area 1).

"Succursale-3" router:	"Siege" router:
router ospf 10	router ospf 10
network 10.1.1.12 0.0.0.3 area 1	network 10.1.1.12 0.0.0.3 area 1
network 192.168.4.0 0.0.0.255 area 1	

## Section Two: Adding a new Virtual Circuit between S1 and S2

To add a new Virtual Circuit, we need to add a new network, 10.1.1.16/30. In this network we can use each IP of our two IP in “Succursale-1” and “Succursale-2” and then we will announce this network in OSPF.

### 1- Frame Relay:



*Adding DLCI 102 in the port serial1*

*Adding DLCI 102 in the port serial2*

Frame Relay				
DSL				
Cable				
INTERFACE				
Serial0				
Serial1				
Serial2				
Serial3				
Serial4				

1	Serial0	VersS1	Serial1	VersSiege
2	Serial0	VersS2	Serial2	VersSiege
3	Serial0	VersS3	Serial3	VersSiege
4	Serial1	VersS2	Serial2	VersS1

*Adding a new connection between serial1 et serial2*

For our new 20Mbps Virtual Circuit, we needed to add a second DLCI in our serial1 with the name “102 VersS2” and also a new DLCI “102 VersS1” in serial2 and we make a link between them in Frame Relay.

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## 2- Physical Interface and Sub-interfaces:

We didn't add any physical device or port, so we didn't need to add any IP addresses in physical interfaces! But we added 10.1.1.16/30 network. In this section we used 10.1.1.137 for the "Succursale-1" in the sub-interface Serial0/0/0.102 and 10.1.1.18 for the "Succursale-2" in the sub-interface Serial0/0/0.102.

In this part, we added "bandwidth 20000" to make a connection with 20Mbps.

In the below you can see this part of configuration from "Succursale-3" router.

"Succursale-1" router:	"Succursale-2" router:
Sub-interface:	Sub-interface:
interface Serial0/0/0.102 point-to-point	interface Serial0/0/0.102 point-to-point
description *** Vers S2	description *** Vers S1
bandwidth 20000	bandwidth 20000
ip address 10.1.1.17 255.255.255.252	ip address 10.1.1.18 255.255.255.252
frame-relay interface-dlci 102	frame-relay interface-dlci 102

## 3- PC's:

We didn't add any PCs in this section.

## 4- OSPF:

For our new Virtual Circuit we announced one new network to the other routers by the commands below.

"Succursale-1" router:	"Succursale-2" router:
router ospf 10	router ospf 10
network 10.1.1.16 0.0.0.3 area 1	network 10.1.1.16 0.0.0.3 area 1